

Docket No. : 28944/50038
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Yves Vincent Brottier et al.

Application No.: To be assigned

Filed: Herewith

Art Unit: To be assigned

For: Hair-Removal Device and Method of Using One
Such Device

Examiner: To be assigned

PRELIMINARY AMENDMENT

MS Amendment
Commissioner for Patents
P O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE SPECIFICATION

At page 1, immediately after the title on line 3, please insert the following paragraph:

--Cross-Reference to Related Application

This is the U.S. National Phase of International Application No. PCT/FR2004/02906 filed 12 November 2004, the entire disclosure of which is incorporated herein by reference.--

At page 1, line 4, please insert the following heading:

--Field of the Invention--

At page 1, line 15, please insert the following heading:

--Background of the Invention--

At page 2, line 6, please insert the following heading:

--Summary of the Invention--

At page 5, line 26, please insert the following heading:

--Brief Description of the Drawings--

At page 6, line 12, please insert the following heading:

--Detailed Description of the Invention--

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A hair-removal device for local skin application, designed to emit at least one light pulse generated by an electric current pulse passing through a flashlamp (FL) forming an electric arc therein, said electric ~~this~~ current coming from the discharge of at least one capacitor (CP) and being controlled by a fast-switching on/off electronic switch (SW), these three elements being placed in a main loop (CP-SW-FL), wherein ~~characterized in that~~, during each discharge of said ~~the~~ capacitor, the current passing through said ~~the~~ flashlamp (FL) generates a measurement signal (UR_m) representative of said current passing through the flashlamp, and wherein ~~and in that~~ said measurement signal (UR_m) is compared with a reference value (U_{ref}) by a hysteresis comparator (COMP) in order to set said switch (SW) in the open or closed state and to regulate said current passing through the flashlamp (FL) by its high-frequency cutoff around a defined current (I_{critic}) through substantially the entire duration of said current pulse.

2. (Currently Amended) The device as claimed in claim 1, wherein said ~~the~~ measurement signal is a measurement voltage (UR_m) proportional to said ~~the~~ current passing through said ~~the~~ flashlamp (FL), which voltage is delivered by a current-voltage transducer, said current-voltage transducer preferably being a resistor (R_m) connected in series in said ~~the~~ main loop (CP-SW-FL).

3. (Currently Amended) The device as claimed in claim 2, wherein a freewheeling diode (D) is incorporated into an additional loop (R_m -FL-D) comprising, in common with said ~~the~~ main loop, said ~~the~~ flashlamp (FL) and said ~~the~~ current-voltage transducer (R_m).

4 (Currently Amended) The device as claimed in claim 1 ~~any one of claims 1 to 3~~, wherein said ~~the~~ main loop (CP-SW-FL) further includes an inductor (IND).

5. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein said the hysteresis comparator (COMP) and said the reference value (U_{ref}) are chosen so as to regulate said the current passing through said the flashlamp (FL) to a value substantially below said the value of said the current for which the expansion of the electric arc reaches the inner walls of said the flashlamp (FL).

6. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein said at least one capacitor (CP) is chosen so that the ratio of the initial voltage (U_i) across its terminals before discharge to the final voltage (U_f) at the end of said the current pulse is between 2 and 6, and preferably about 4.

7. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein said at least one capacitor has a capacitance at most equal to 13 000 microfarads and a nominal voltage at most equal to 400 volts, said at least one capacitor preferably being an electrolytic capacitor.

8. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein the capacitance of said the capacitor (CP) is chosen so that the mean value of said the current flowing through said the flashlamp (FL), measured over a period of one millisecond at the end of said the current pulse, is between 90% and 100% of said the mean value of the current measured over the same period at the start of the current pulse.

9. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein said the electronic switch (SW) is chosen so as to have a switching time considerably shorter than one microsecond, said switch preferably being an IGBT.

10. (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein an electronic control module (CON) is designed to deliver said the reference value (U_{ref}) to said the hysteresis comparator (COMP) and designed to deliver a current pulse in said the main loop over a specified pulse duration, said pulse duration being between 20 ms and 45 ms, and preferably equal to about 35 ms.

11. (Currently Amended) The device as claimed in claim 10, wherein said the control module (CON) is designed to introduce, into said the fast-switching switch (SW), a delay ($T_{prevent}$) of specified duration at each opening of this switch (SW), during which it is prevented from switching again to the closed state, said the specified duration being significantly longer than the switching time of said the switch (SW) but shorter than the time needed for said the flashlamp (FL) to be turned off

12. (Currently Amended) The device as claimed in claim 10 ~~or 11~~, wherein ~~the~~ control module (CON) is designed so as not to cause a new current pulse to be emitted before a specified time, called the rest time, has elapsed since the preceding current pulse, said the specified rest time being between one second and ten seconds, and preferably about seven seconds.

13 (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein said at least one capacitor (CP), said the electronic switch (SW) and said the hysteresis comparator (COMP) are housed in a same casing, said casing having a volume of less than five liters

14 (Currently Amended) The device as claimed in claim 1 ~~any one of the preceding claims~~, wherein the weight of the overall device is at most equal to two kilograms.

15. (Currently Amended) A method of employing a hair-removal device designed to emit at least one light pulse generated by an electric current pulse passing through a flashlamp (FL) forming an electric arc therein, wherein at least one capacitor (CP), designed to deliver said the current passing through said the flashlamp, and a fast-switching on/off electronic switch (SW) are provided, said the capacitor (CP), said the electronic switch (SW) and said the flashlamp (FL) forming a main loop (CP-SW-FL), said method comprise characterized in that it comprises, while generating said the electric current pulse, the steps of:

- generating a measurement signal (UR_m) representative of said the current passing through said the flashlamp (FL);
- comparing, with hysteresis, said the measurement signal (UR_m) with a reference value (U_{ref});
- closing said the electronic switch (SW) if the comparison between said the measurement signal (UR_m) and said the reference value (U_{ref}) indicates that said the current passing through said the flashlamp (FL) is below a specified current (I_{critic}); or
- opening said the electronic switch (SW) if the comparison between said the measurement signal (UR_m) and said the reference value (U_{ref}) indicates that said the current passing through said the flashlamp (FL) is above said the specified current (I_{critic}), so as to regulate said current passing through said the flashlamp (FL) by high-frequency cutoff thereof around the specified current (I_{critic}).

16. (Currently Amended) The method as claimed in claim 15, wherein, each time said the switch (SW) is opened, a delay step (T_{prevent}) of specified duration is provided, during which said the switch (SW) is prevented from switching again to the closed state, said the specified time being significantly longer than the switching time of said the switch (SW) but shorter than the time needed for said the flashlamp to be turned off.

REMARKS

By the foregoing amendments, the specification has been revised to provide a cross-reference to the international application and appropriate headings. In addition, the claims have been amended to omit multiple dependencies and better conform to standard U.S. practice.

The filing fee has been calculated based on the claims as amended above. No new matter has been added.

Dated: May 11, 2006

Respectfully submitted,

By 

Thomas A. Miller

Registration No.: 40,091

MILLER MATTHIAS & HULL

One North Franklin Street

Suite 2350

Chicago, Illinois 60606

(312) 977-9902

Attorney for Applicant